

CENTRAL INTELLIGENCE AGENCY

This material contains information affecting the National Defense of the United States within the meaning of the Espionage Laws, Title 18, U.S.C. Secs. 793 and 794, the transmission or revelation of which in any manner to an unauthorized person is prohibited by law.
50X1-HUM
C-O-N-F-I-D-E-N-T-I-A-L
NO FOREIGN DISSEM 50X1-HUM

COUNTRY USSR REPORT
SUBJECT Technical Study of Soviet 130-mm Artillery Shell DATE DISTR. 13 May 1964
NO. PAGES 1
REFERENCES

DATE OF INFO.
PLACE & DATE ACQ
50X1-HUM
THIS IS UNEVALUATED INFORMATION. SOURCE GRADINGS ARE DEFINITIVE. APPRAISAL OF CONTENT IS TENTATIVE.

[redacted] a nine-page technical study concerning an expended, spin-stabilized, 130-mm Soviet artillery shell [redacted] 50X1-HUM
The study includes drawings and photographs of the shell; and chemical, mechanical, and technological analysis of the shell casing material. Markings data are also included. 50X1-HUM
Comment: The tested shell is assessed as a practice shell made of plain, coarse-grain, annealed carbon steel. This assessment was made because a screw base was used as a fuse replacement, and because the front part of the shell shows no greater hardening, although it has the customary external shape of a concrete or light-armor piercing shell [redacted] 50X1-HUM

Distribution of Attachment for Retention:

[redacted] 50X1-HUM
Army/FSTC: 1 copy
[redacted]

50X1-HUM

C-O-N-F-I-D-E-N-T-I-A-L
NO FOREIGN DISSEM

GROUP 1
Excluded from automatic
downgrading and
declassification

STATE	DIA	ARMY #	NAVY	AIR	NSA	XX NIC	[redacted]	50X1-HUM
Army/FSTC								
(Note: Field distribution indicated by "#")								

INFORMATION REPORT INFORMATION REPORT

50X1-HUM
50X1-HUM

CONFIDENTIAL

Country: USSR


NO FOREIGN DISSEM

50X1-HUM



50X1-HUM

Concerning: Soviet 130 Millimeter Shell


The photographs and drawings in the enclosure deal with an expended, spin stabilized  130 millimeter Soviet shell.


50X1-HUM

The ogive of the shell is blunt, and in all probability the live shell is provided with a ballistic cap (enclosure 1).

A bourrelet (enclosure 1) is located at the starting point of the ogive section, and 5 millimeters above the rotating band, on the cylindrical part of the shell.

The rotating band is 25 centimeters wide, consisting of copper or a copper alloy. It has 4-millimeter-wide lands and 6-millimeter-wide grooves incised, with right-hand rifling of the bore.

tail of the
The projectile  is tapered. There is no annular groove for gripping a shell casing. The interior of the casing is a cylindrical hollow of 960 cubic centimeters volume, open at the base of the projectile and sealed by the screw base. The latter has a metric left-hand thread with a 95 millimeter tip diameter and 3 millimeter pitch (enclosure 1).

Enclosure 2 shows the inscription of the shell and the screw base, *but* indeed partly so light and irregular as to be scarcely *legible*  on the photographs.

Enclosure 3 has a 1 : 2 scale copy of the characters.

The shell is identified by Russian letters and Arabic numerals.

Ball impressions, from a Brinnell hardness test, are found on the cylindrical part of the shell and on the screw base.

The shell, including the screw base, weighs 31.250 kilograms.

CONFIDENTIAL

The bursting charge of TNT, at the usual density of 1.59, for the 960 cubic centimeter hollow interior would probably weigh about 1.5 kilogram^s.

No covering ^[paint] could be determined on the shell.

A chemical, mechanical and technological, and metallographical analysis of the shell casing material yielded the following findings:

a) Chemical analysis: (percent)

Carbon -- 0.58

Manganese -- [plus or minus?] 0.64

Silicon -- 0.25

Phosphorous -- 0.030

Sulfur -- 0.014

Nickel -- less than 0.4

b) Mechanical and technological analysis: (percent)

Tensile strength kilograms per square millimeter -- 79.2

Elastic limit kilograms per square millimeter -- 42.0

Elongation at fracture percent -- 18.4

Shrinkage percent -- 20.4

Notch impact strength, mkg [meter-kilograms?] per square centimeter, lengthwise--
1.7

Notch impact strength, mkg per square centimeter, transverse--1.7

To determine the elastic limit, tensile strength, elongation at fracture, and shrinkage, a specimen was prepared. A ^{sample} ~~was~~ was prepared ~~longitudinally~~ and ^{one} ~~was~~ lateral^y, in respect to the axis of the shell, ^{for the} determination of the notch impact strength.

c) Metallographical analysis:

From enclosure 5 it is to be noted that the (grain) structure of the tested shell is predominantly perlite, with ferrite at the grain boundaries. The grain diameter of the crystallite is identical for all sides. The structure is not linear shaped, and contains no dissociations and segregations.

CONFIDENTIAL

d) Determination of the hardness curve:

-3-

A 20 millimeter wide strip was cut out of the shell half section , and the strip's surface was polished, to determine the hardness curve (see enclosure 6).

Assessment

The tested shell is a practice shell made of plain, coarse-grain, annealed carbon steel, since

1. a screw base was used ^{instead of} as a fuze replacement ~~as~~ a base detonating fuze, and
2. the front part shows no greater hardening, although it has the customary external shape of a "Beton-Granate" [probably concrete piercing shell] or a "Halbpanzer-Granate" [possibly shell to pierce light armored vehicles].

(Captions:)

1. View of the shell
2. Shell cross-section
3. Screw base
4. Identification of the shell on the cylindrical part and the screw base
5. Impressed identification numbers on the shell
6. Ball impression
7. Scale 1 : 2
8. Shell and screw base
9. Screw base
10. Left-hand thread, 3 millimeter pitch
11. Copper ~~rotating~~ band
12. Photo 1
13. Hardness curve (profile) of shell casing

CONFIDENTIAL

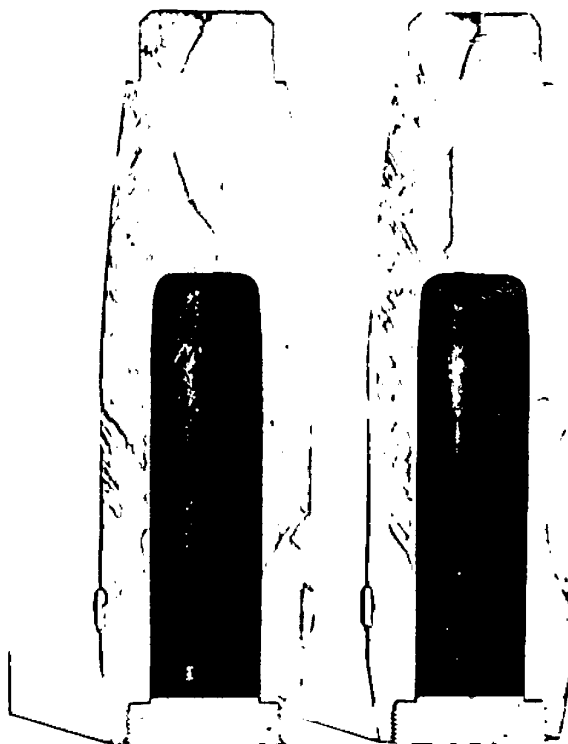
NO FOREIGN DISSEM

CONFIDENTIAL

50X1-HUM

NO FOREIGN DISSEM

-4-



50X1-HUM

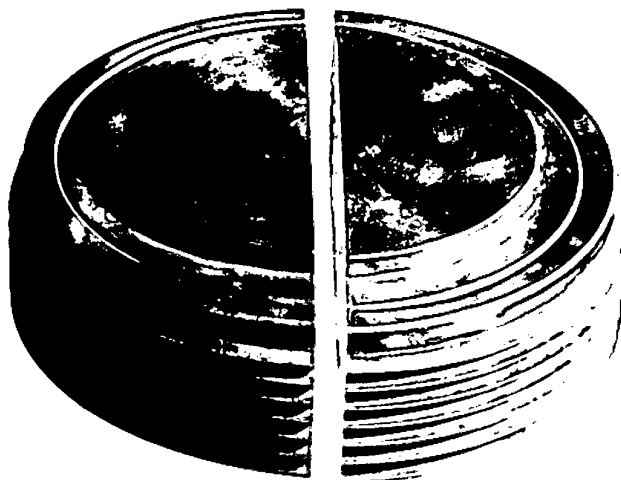
View of the shell

Shell cross-section



50X1-HUM

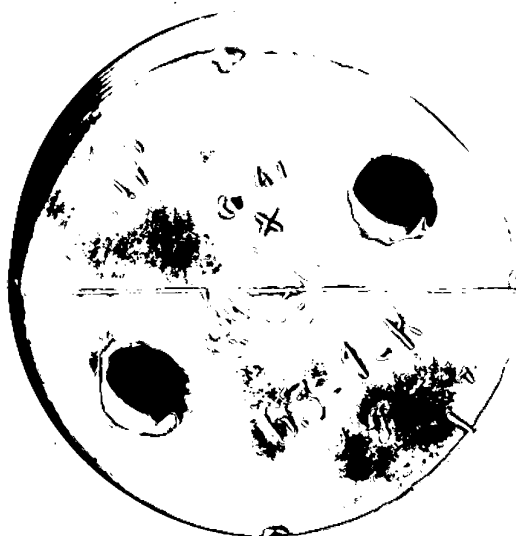
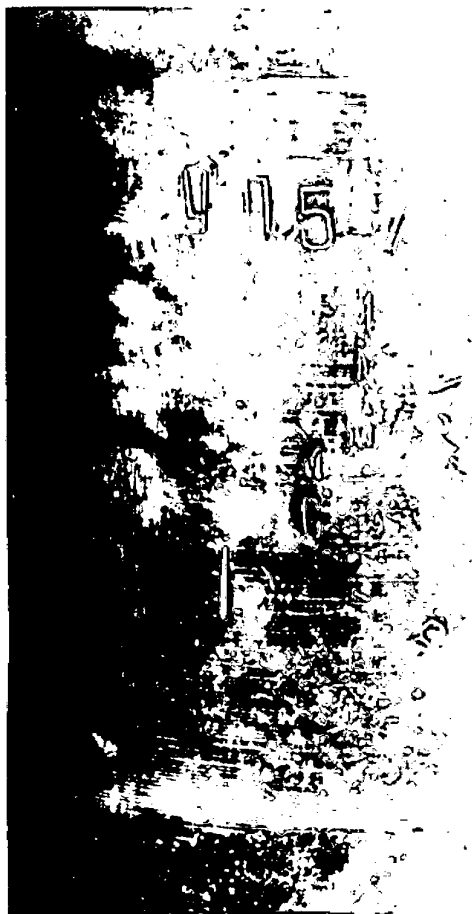
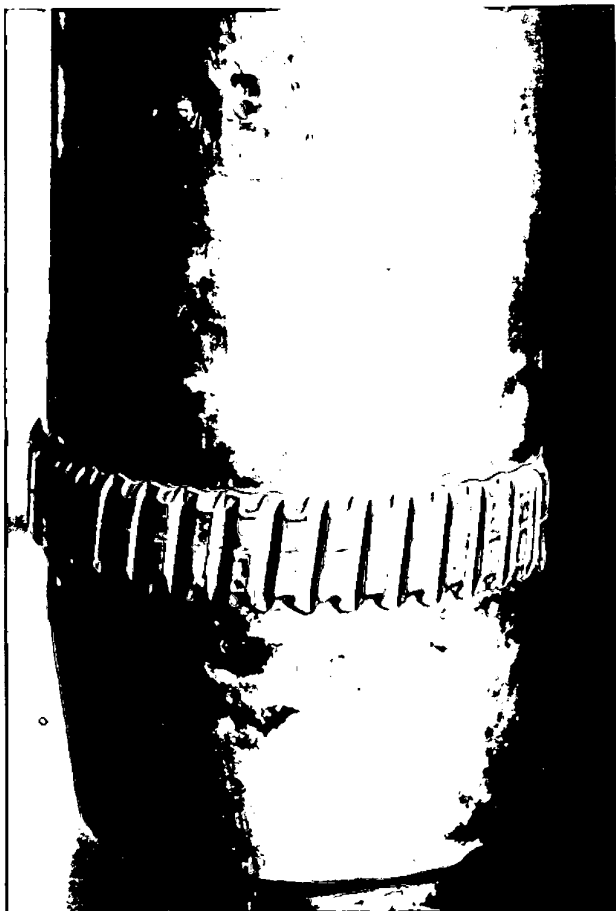
Screw base



CONFIDENTIAL
NO FOREIGN DISSEM

50X1-HUM

Identification of the shell on the cylindrical
part and the screw base



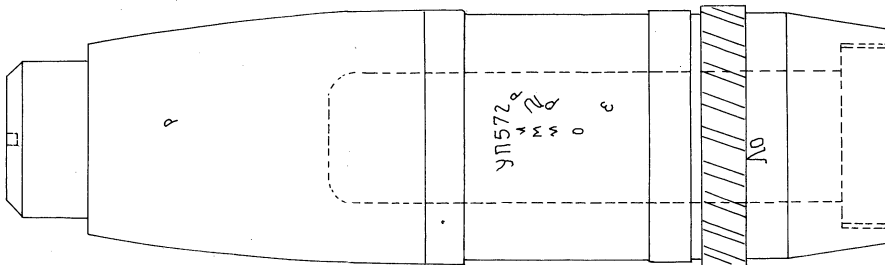
CONFIDENTIAL

NO FOREIGN DISSEM

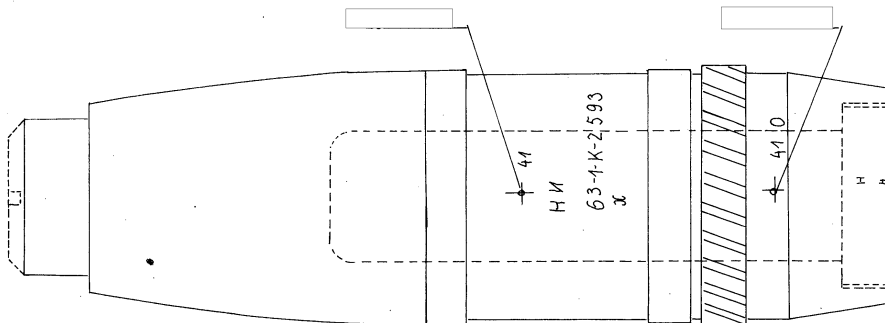
CONFIDENTIAL

NO FOREIGN DISSEM

Impressed identification numbers on the shell



Ball impression



CONFIDENTIAL

NO FOREIGN DISSEM

Scale 1 : 2

CONFIDENTIAL

NO FOREIGN DISSEM 50X1-HUM

50X1-HUM

50X1-HUM

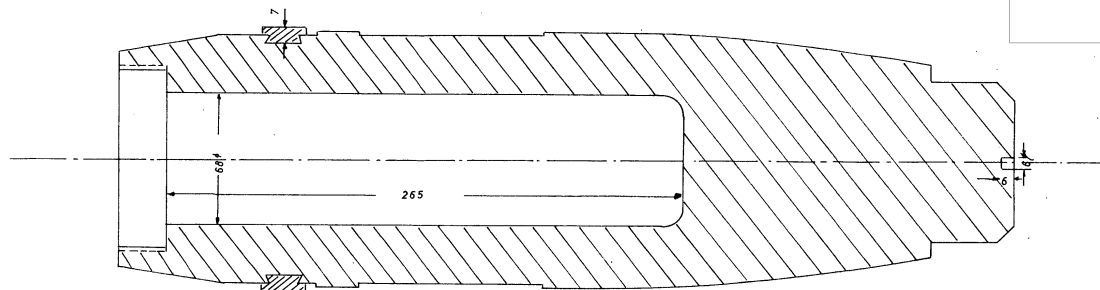
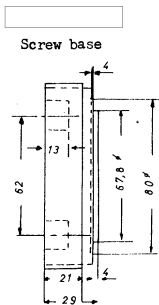
50X1-HUM

CONFIDENTIAL

NO FOREIGN DISSEM

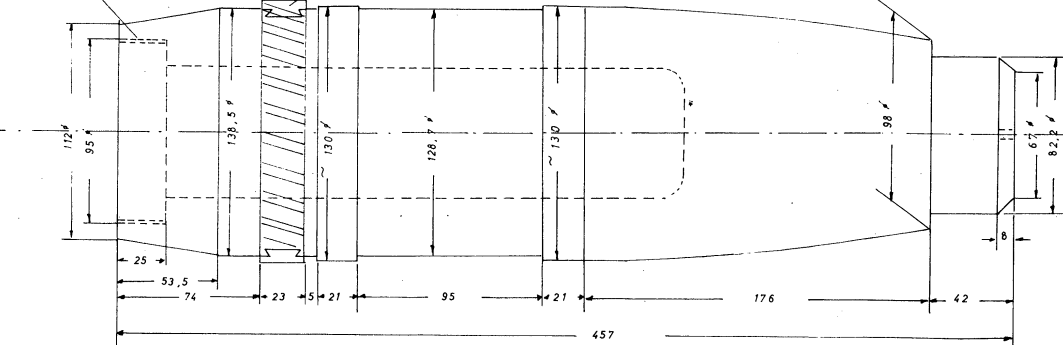
Shell and Screw Base

50X1-HUM
CONFIDENTIAL
NO FOREIGN DISSEM
-7- 50X1-HUM



50X1-HUM

Left-hand thread, 3 millimeter pitch
Copper rotating band



50X1-HUM
50X1-HUM

CONFIDENTIAL


50X1-HUM
CONFIDENTIAL
NO FOREIGN DISSEM

Scale 1 : 2



Photo 1

CONFIDENTIAL



.....27,2

Declassified in Part - Sanitized Copy Approved for Release 2014/05/20 : CIA-RDP80T00246A073000480001-8